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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,231	08/20/2003	Alexander Wayne Hietala	2867-261	6471

27820 7590 11/14/2006

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EXAMINER	
PANWALKAR, VINEETA S	

ART UNIT	PAPER NUMBER
2611	

DATE MAILED: 11/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/644,231	HIETALA ET AL.	
	Examiner	Art Unit	
	Vineeta S. Panwalkar	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,11-13,15-17,25-27,29-31 and 39* is/are rejected.

7)☒ Claim(s) *4-10,14,18-24,28 and 33-38* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/20/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-3, 11, 13, 15-17, 25, 27, 29- 31 and 39 are rejected under 35 U.S.C. 102(e) as being anticipated by Song et al. (US 6850748 B2), hereinafter, Song.

1a. Regarding claims 1, 15 and 29, Song shows a receiver comprising:

- first mixing circuitry (Fig. 5, mixers 505 and 506 are interpreted as claimed first mixing circuitry) adapted to receive a received signal and multiply the received signal by a first local oscillator (LO) signal (Fig. 5, signal 517) to provide an intermediate frequency (IF) signal (First mixers 505, 506 mix the signal received from the optional image reject filter 504, or from LNA 503 if the image reject filter is not included in the circuit, with the first mixing frequency 517 to produce the in-phase IF signal (as claimed) and the quadrature-phase IF signal (as claimed), respectively)

- second mixing circuitry adapted to receive the IF signal from the first mixing circuitry and multiply the IF signal by a second LO signal to provide an output signal (Fig. 5, mixers 513 and 514 are interpreted as claimed second mixing circuitry);
- a first divider circuit adapted to receive a reference signal from a reference oscillator and divide the reference signal by a first divisor N to provide the first LO signal (Fig. 5, first divider 507 is interpreted as claimed first divider circuit and the value by which the divider divides the signal output by local oscillator 508 (claimed reference signal) to produce signal 517 (claimed first LO signal) is interpreted as claimed N); and
- a second divider circuit adapted to receive the reference signal from the reference oscillator and divide the reference signal by a second divisor M to provide the second LO signal (Fig. 5, second divider 511 is interpreted as claimed second divider circuit and the value by which the divider divides the signal output by local oscillator 508 (claimed reference signal) to produce signal 518 (claimed second LO signal) is interpreted as claimed M),
- the first divisor N and the second divisor M are each integers greater than or equal to one (1) and the second divisor M is not a multiple of the first divisor N (Fig. 5. First divider 507 divides by 2 (claimed N, greater than or equal to one) and second divider 511 divides by 3 (claimed M, is not a multiple of the first divisor). See column 7, lines 6-26).

(Regarding claims 15 and 29, Song shows corresponding claimed means and method. Also, see Fig. 4 and column 6, line 33 – column 7, line 56).

1b. Regarding claims 2, 16 and 30, Song further the receiver wherein:

- the second mixing circuitry comprises a quadrature mixer and the first and second divider circuits are further adapted to provide the first and second LO signals as quadrature signals (Column 6, lines 33-56. Since the mixers of the receiver are implemented as quadrature mixers, the claimed second mixer circuitry is a quadrature mixer and the LO signals 518 and 517 are inherently quadrature signals. Regarding claims 16 and 30, Song shows corresponding claimed means and method).

1c. Regarding claim 3, 17 and 31, Song further discloses the receiver wherein:

- a frequency of the reference signal and the first and second divisors N and M are selected such that the second mixing circuitry provides the output signal as a baseband signal (Fig. 5 and column 6, line 57- column 7, line 6. Regarding claims 17 and 31, Song shows corresponding claimed means and method).

1d. Regarding claim 11, 25 and 39, Song shows receiver comprising:

- a filtering circuitry between the first and second mixing circuitries, the filtering circuitry adapted to receive the IF signal and to provide a filtered IF signal to the second mixing circuitry (The in-phase IF signal is provided to second mixer 513 either directly or after being amplified or filtered by an optional gain or filter stage 509. Similarly, the quadrature-phase IF signal is provided to

second mixer 514 either directly or after being amplified or filtered by an optional gain or filter stage 510. See column 6, lines 57-63. Regarding claims 25 and 39, Song shows corresponding claimed means and method).

1e. Regarding claims 13 and 27, Song discloses the optional filters 509/510. These filters filter the IF signals and are hence inherently bandpass filters.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 12 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song.

2a. Regarding claims 12 and 26, Song shows all the limitations claimed, but fails to explicitly disclose what type of filters may be used. However, it is well known in the art to use a polyphase filter for IF signals when the IF signal is quadrature phase and it would have been obvious to a person of ordinary skill in the art to use the polyphase filter for Song's quadrature phase IF signals so as to have one filter on board to take care of both IF signals.[1]

Allowable Subject Matter

3. Claims 4-10,14, 18-24, 28and 32-38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

[1] A few references showing IF polyohase filters in receivers with quadrature mixers:
- Kianush et al. (US 5715529)
- Kumar et al. (US 2003/0076899 A1)

- Baltus (US 6282413 B1) discloses multistage frequency conversion with single local oscillator.
  - Jackson et al. (US 6356597 B1) show receiver with dividers for local oscillator frequency.
  - Van Bezooijen (US 6085075) shows a frequency synthesizer for generating a local oscillator signal for the radio frequency mixer.
  - Chominski et al. (US 6915117 B2) show a multi-stage modulation in a transmitter.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vineeta S. Panwalkar whose telephone number is 571-272-8561. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-

direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

VP